

GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION
SPONSORED PROJECT INITIATION

Date: 8/8/80

Project Title: Unintentional Radiation Exploitation (URE) Techniques

Project No: A-2626

Project Director: ~~Mr. L. D. Holland~~

John Borden

S

Sponsor: USAERADCOM; Fort Monmouth, New Jersey 07703

Agreement Period: From 3/25/80 Until 12/24/80 (Perf. Period)

Type Agreement: Delivery Order No. 1Y-01 under Contract No. F33657-80-G-0077

Amount: \$95,000

Reports Required: Monthly Status Reports; Design Plan; Final Technical Report

Sponsor Contact Person (s):

Technical Matters

Mr. John T. Cervini
ATTN: DELEW-E W45P77
Electronic Warfare Laboratory
USAERADCOM
Fort Monmouth, NJ 07703

Contractual Matters

(thru OCA)

Mr. Thomas A. Bryant
ONR Resident Representative ^{ve}
Georgia Institute of Technology
325 Hinman Research Building
Atlanta, GA 30332

Defense Priority Rating: DO-A7 under DMS Reg. 1

Assigned to: SEL/SIB (School/Laboratory)

COPIES TO:

Project Director
Division Chief (EES)
School/Laboratory Director
Dean/Director-EES
Accounting Office
Procurement Office
Security Coordinator (OCA)
Reports Coordinator (OCA)

Library, Technical Reports Section
EES Information Office
EES Reports & Procedures
Project File (OCA)
Project Code (GTRI)
Other _____

SPONSORED PROJECT TERMINATION SHEETDate 12/30/81

Project Title: Unintentional Radiation Exploitation (URE) Techniques

Project No: A-2626

Project Director: Mr. L. D. Holland

Sponsor: USAERADCOM; Ft. Monmouth, N.J. 07703

Effective Termination Date: 12/24/80Clearance of Accounting Charges: 12/24/80

Grant/Contract Closeout Actions Remaining:

- ☒ Final Invoice ~~and Closing Documents~~
- ☐ Final Fiscal Report
- ☐ Final Report of Inventions
- ☐ Govt. Property Inventory & Related Certificate
- ☐ Classified Material Certificate
- ☐ Other _____

Assigned to: SEL/SEB (School/Laboratory)COPIES TO:

Administrative Coordinator
Research Property Management
Accounting
Procurement/EES Supply Services

Research Security Services
Reports Coordinator (OCA) ✓
Legal Services (OCA)
Library

EES Public Relations (2)
Computer Input
Project File
Other _____

"UNINTENTIONAL RADIATION EXPLOITATION (URE) TECHNIQUES"

Monthly Status Report
for the Period 25 - 30 April, 1980

Contract No. F33657-80-G-0077
Delivery Order IY-01
Deliverable Item A002

20 October, 1980

Prepared for
U.S. Army Electronics Research and Development Command
ELECTRONIC WARFARE LABORATORY, DELEW-E
Ft. Monmouth, N.J. 07703

Prepared by
GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station
Systems Engineering Laboratory
ESM Division
Atlanta, Georgia 30332

OBJECTIVE:

The purpose of this research program is to identify and assess the feasibility of techniques for exploiting unintentional radiation from systems which emit electromagnetic energy. The objective of the program is to develop effective concepts and specifications for hardware suitable for field test feasibility determination.

ACTIVITIES DURING REPORTING PERIOD:

Activity included a visit by Georgia Tech-EES project staff to the ERADCOM EW Laboratory, Ft. Monmouth, for a project start-up meeting with the Technical Monitor, and EES-internal meetings to plan and initiate project work.

PROBLEMS ENCOUNTERED:

No problems were experienced.

PLANS FOR NEXT REPORTING PERIOD:

Activities will consist of further defining the program plan and initiating work on a RINT data base document, to be expanded as the project proceeds.

FINANCIAL STATUS:

The financial status of the contract, as of the end of the reporting period, is given below in tabular form and presented graphically in the attached figure.

CONTRACT FUNDS:

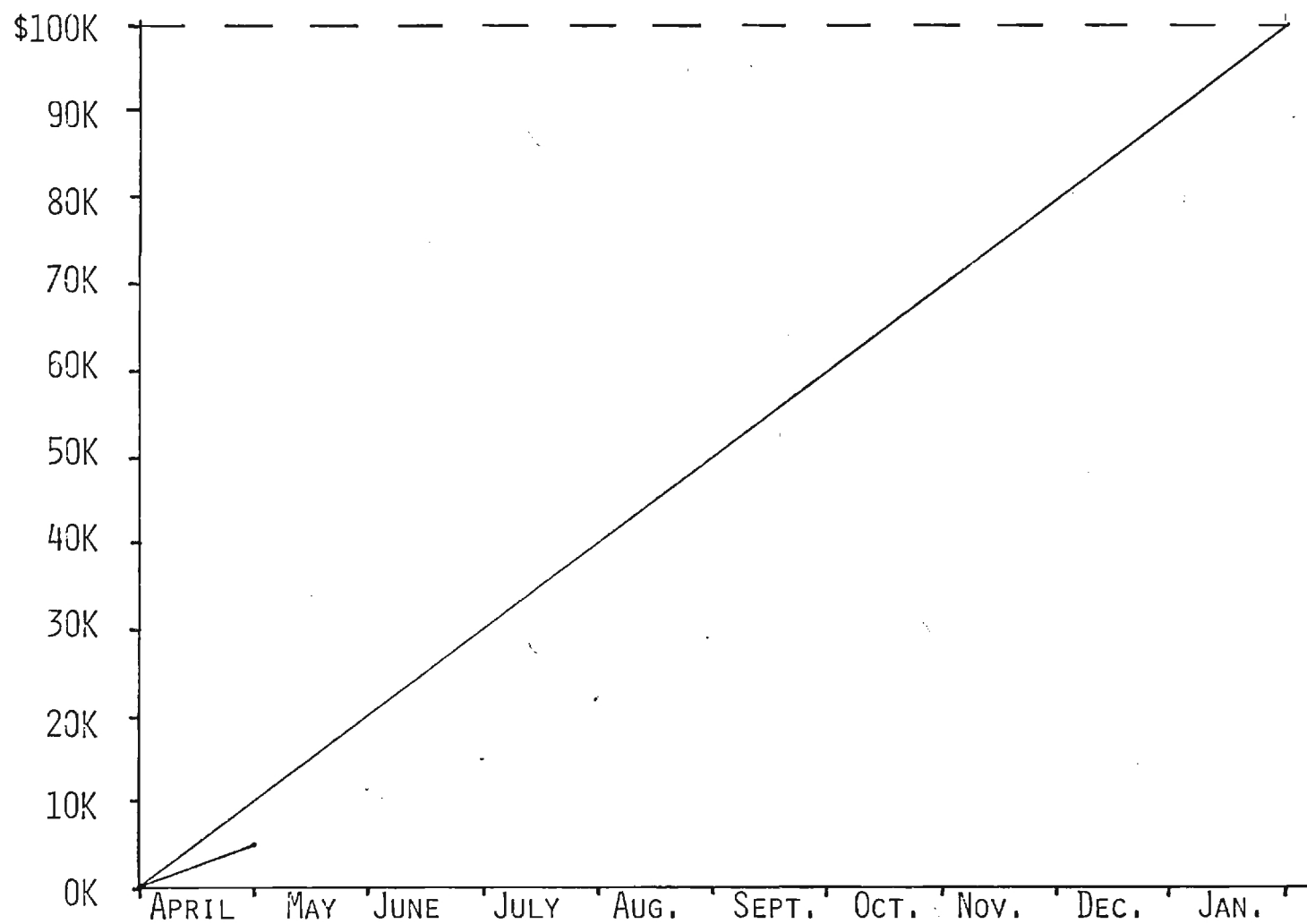
\$95,000.00

EXPENDITURES/ENCUMBRANCES:

	<u>During Reported Period</u>	<u>Accumulated</u>	
Personal Services	\$2079.07	\$2079.07	
Retirement	218.51	218.51	
Overhead	1580.09	1580.09	
Materials and Supplies	-	-	
Travel	<u>1065.00</u>	<u>1065.00</u>	
TOTALS:	\$4942.67	\$4942.67	4,942.67

BALANCE:

\$90,057.33



CONTRACT #F33657-80-G-0077

TOTAL EXPENDITURES

"UNINTENTIONAL RADIATION EXPLOITATION (URE) TECHNIQUES"

Monthly Status Report
for the Period 1 - 31 May, 1980

Contract No. F33657-80-G-0077
Delivery Order IY-01
Deliverable Item A002

20 October, 1980

Prepared for
U.S. Army Electronics Research and Development Command
ELECTRONIC WARFARE LABORATORY, DELEW-E
Ft. Monmouth, N.J. 07703

Prepared by
GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station
Systems Engineering Laboratory
ESM Division
Atlanta, Georgia 30332

OBJECTIVE:

The purpose of this research program is to identify and assess the feasibility of techniques for exploiting unintentional radiation from systems which emit electromagnetic energy. The objective of the program is to develop effective concepts and specifications for hardware suitable for field test feasibility determination.

ACTIVITIES DURING REPORTING PERIOD:

Work was started on the preparation of a data base and discussions were held with project personnel to more clearly define assignment of tasks to accomplish the terms of the work statement.

PROBLEMS ENCOUNTERED:

No problems were experienced.

PLANS FOR NEXT REPORTING PERIOD:

Continuation of work on the data base and exploration of applications to the Quick Look II system will be conducted.

FINANCIAL STATUS:

The financial status of the contract, as of the end of the reporting period, is given below in tabular form and presented graphically in the attached figure.

CONTRACT FUNDS:

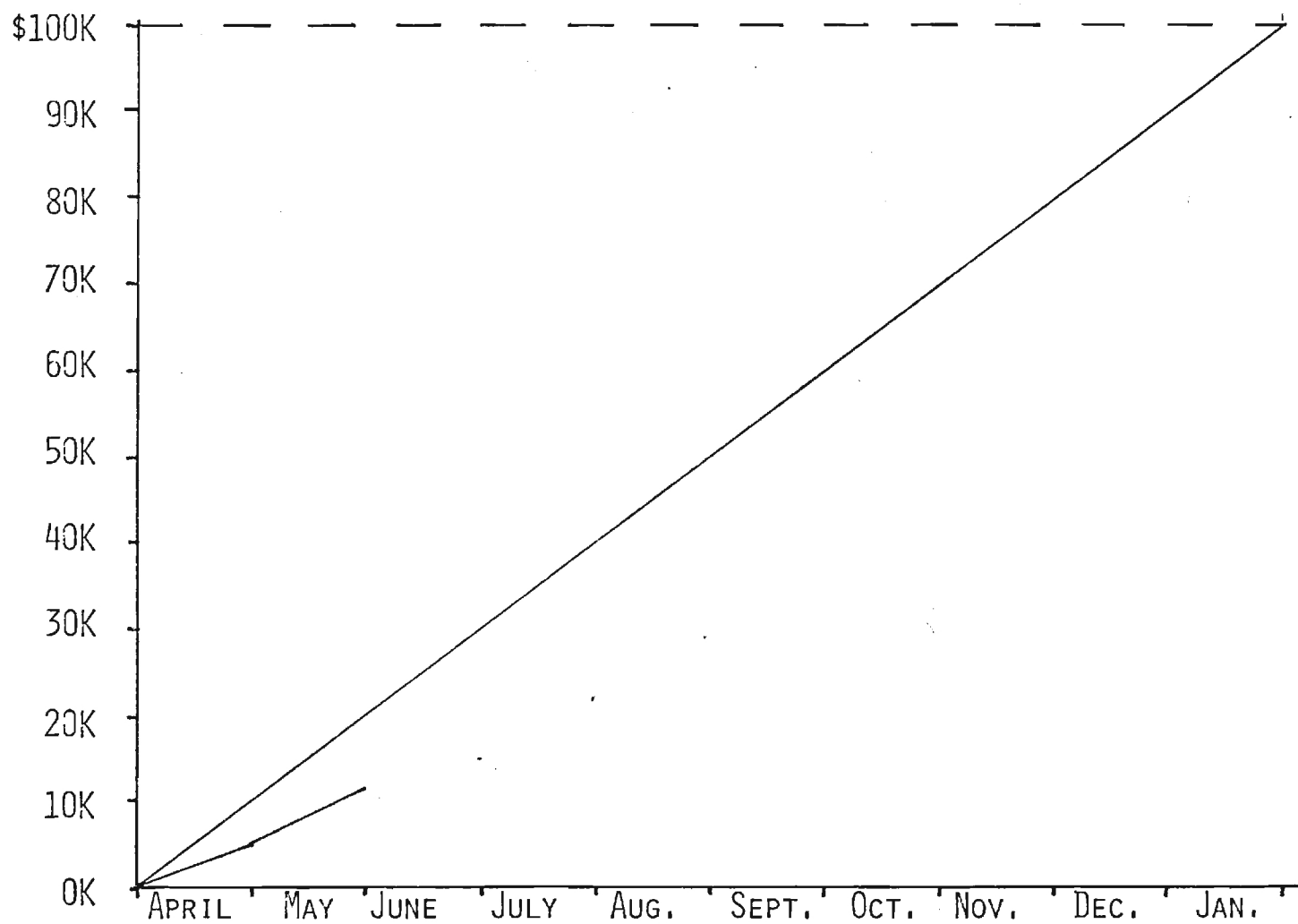
\$95,000.00

EXPENDITURES/ENCUMBRANCES:

	<u>During Reported Period</u>	<u>Accumulated</u>	
Personal Services	\$3421.47	\$5491.54	
Retirement	358.66	577.17	
Overhead	2593.48	4173.57	
Materials and Supplies	7.44	7.44	
Travel	<u>1238.69</u>	<u>1238.69</u>	
TOTAL:	7610.74	11488.41	\$11,488.41

BALANCE:

\$83,511.59



CONTRACT #F33657-80-G-0077

TOTAL EXPENDITURES

"UNINTENTIONAL RADIATION EXPLOITATION (URE) TECHNIQUES"

Monthly Status Report
for the Period 1 - 30 June, 1980

Contract No. F33657-80-G-0077
Delivery Order IY-01
Deliverable Item A002

20 October, 1980

Prepared for
U.S. Army Electronics Research and Development Command
ELECTRONIC WARFARE LABORATORY, DELEW-E
Ft. Monmouth, N.J. 07703

Prepared by
GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station
Systems Engineering Laboratory
ESM Division
Atlanta, Georgia 30332

OBJECTIVE:

The purpose of this research program is to identify and assess the feasibility of techniques for exploiting unintentional radiation from systems which emit electromagnetic energy. The objective of the program is to develop effective concepts and specifications for hardware suitable for field test feasibility determination.

ACTIVITIES DURING REPORTING PERIOD:

Activity was concentrated on examination of the data base available at Ga. Tech with a view to producing an extensive data base document, complete with abstracts, based on actual reading of the source documents. The intent is to expand the data base as the project continues.

In the course of reviewing these documents a number of observations of importance were made concerning the quality of the signal data:

1) Effective Radiated Power (ERP)

Signals of interest are characterized by having very low power levels generally, and the feasibility of any potential application hinges on the maximum detection range of the signal being greater than the minimum range from which the application can be implemented; however, only a very small percentage of the reviewed documents contain useful ERP data.

2) Contaminated Data

Measurements made of such low-level signals from real systems housed in metal Butler-type buildings are contaminated by multiple reflections from the interior walls of the building(s) and are thus not reliable. There is a real need for a "quiet building" designed and constructed specifically to reduce unwanted reflections to acceptably low levels. Similarly, for test-range measurements, there exists a need for a somewhat automated measurement system.

PROBLEMS ENCOUNTERED:

No problems were experienced.

PLANS FOR NEXT REPORTING PERIOD:

Continue work on the data base and obtain material from ERADCOM-EWL on the Quick Look II system.

FINANCIAL STATUS:

The financial status of the contract, as of the end of the reporting period, is given below in tabular form, and is presented graphically in the attached figure.

CONTRACT FUNDS:

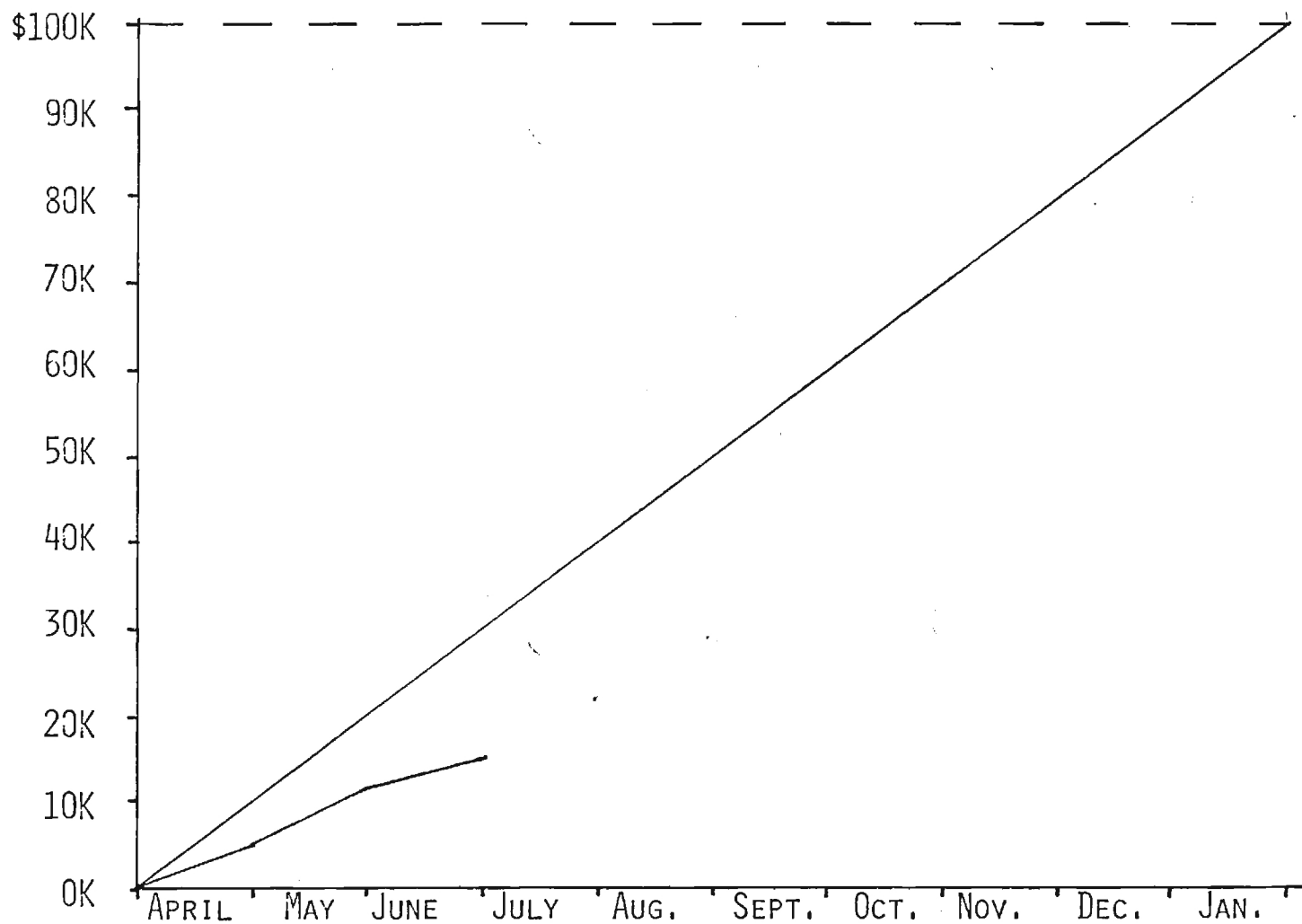
\$95,000.00

EXPENDITURES/ENCUMBRANCES:

	<u>During Reported Period</u>	<u>Accumulated</u>	
Personal Services	\$1747.16	\$7238.70	
Retirement	183.63	760.80	
Overhead	1327.84	5501.41	
Materials and Supplies	-	7.44	
Travel	-	1238.69	
TOTAL:	3258.63	14747.04	\$14,747.04

BALANCE:

\$80,252.96



CONTRACT #F33657-80-G-0077

TOTAL EXPENDITURES

"UNINTENTIONAL RADIATION EXPLOITATION (URE) TECHNIQUES"

Monthly Status Report
for the Period 1 - 31 July, 1980

Contract No. F33657-80-G-0077
Delivery Order IY-01
Deliverable Item A002

20 October, 1980

Prepared for
U.S. Army Electronics Research and Development Command
ELECTRONIC WARFARE LABORATORY, DELEW-E
Ft. Monmouth, N.J. 07703

Prepared by
GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station
Systems Engineering Laboratory
ESM Division
Atlanta, Georgia 30332

OBJECTIVE:

The purpose of this research program is to identify and assess the feasibility of techniques for exploiting unintentional radiation from systems which emit electromagnetic energy. The objective of the program is to develop effective concepts and specifications for hardware suitable for field test feasibility determination.

ACTIVITIES DURING REPORTING PERIOD:

A draft of the data base was produced; it is complete on the basis of the material available at Ga. Tech. Information was extracted and compiled for comparison and presentation to the project monitor.

The list of high priority threat systems of concern to this study, provided by EWL, was reviewed. A preliminary cut was made at constructing, on paper, the total network containing these systems on the basis that the threat systems and all the associated systems should be looked at for potential applications.

PROBLEMS ENCOUNTERED:

No problems were experienced.

PLANS FOR NEXT REPORTING PERIOD:

Formalize the draft data base and study the Quick Look II system material provided by the sponsor. Additional information has been requested.

FINANCIAL STATUS:

The financial status of the contract, as of the end of the reporting period, is given below in tabular form, and is presented graphically in the attached figure.

CONTRACT FUNDS:

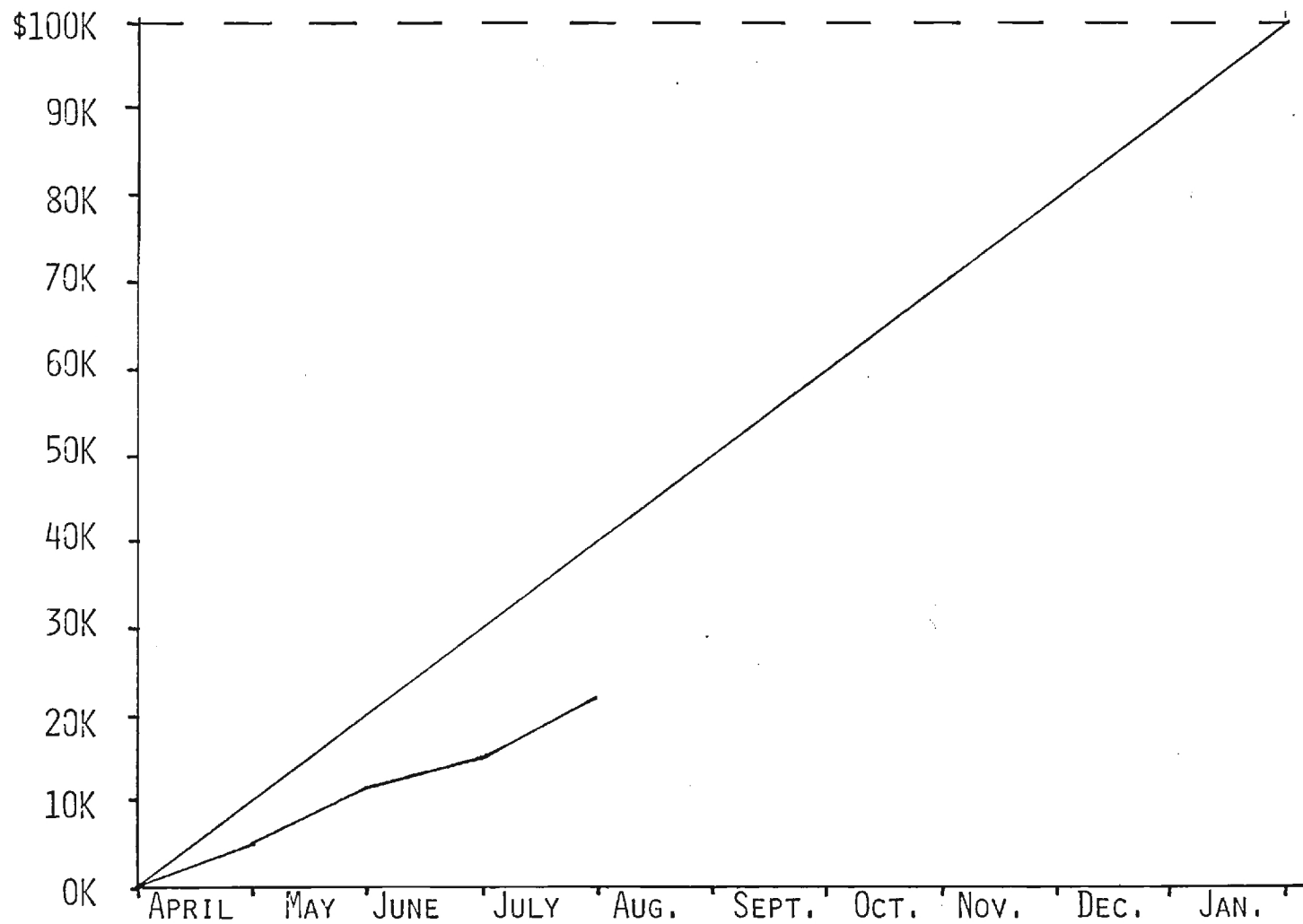
\$95,000.00

EXPENDITURES/ENCUMBRANCES:

	<u>During Reported Period</u>	<u>Accumulated</u>	
Personal Services	\$4029.12	\$11267.82	
Retirement	445.29	1206.09	
Overhead	2941.26	8442.67	
Materials and Supplies	.90	8.34	
Travel	<u>4.65</u>	<u>1243.34</u>	
TOTALS:	7421.22	22168.26	\$22,168.26

BALANCE:

\$72,831.74



CONTRACT #F33657-80-G-0077

TOTAL EXPENDITURES

"UNINTENTIONAL RADIATION EXPLOITATION (URE) TECHNIQUES"

Monthly Status Report
for the Period 1 - 31 August, 1980

Contract No. F33657-80-G-0077
Delivery Order IY-01
Deliverable Item A002

20 October, 1980

Prepared for
U.S. Army Electronics Research and Development Command
ELECTRONIC WARFARE LABORATORY, DELEW-E
Ft. Monmouth, N.J. 07703

Prepared by
GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station
Systems Engineering Laboratory
ESM Division
Atlanta, Georgia 30332

OBJECTIVE:

The purpose of this research program is to identify and assess the feasibility of techniques for exploiting unintentional radiation from systems which emit electromagnetic energy. The objective of the program is to develop effective concepts and specifications for hardware suitable for field test feasibility determination.

ACTIVITIES DURING REPORTING PERIOD:

Effort was concentrated on evaluating the data base, with an eye toward application to a potential system to be installed on the Quick Look II (QLII) aircraft. Information received pertaining to the QLII was studied.

Threat documents describing the priority threat system emitters, previously identified by EWL, were collected and information was extracted on the primary signals for these systems, the purpose being to identify any overlaps of primary intentional emissions from any one system with the secondary unintentional emissions from the same or any other threat system. An internal document was prepared, and the frequency data were plotted as a function of PRI.

PROBLEMS ENCOUNTERED:

No problems were experienced.

PLANS FOR NEXT REPORTING PERIOD:

Investigate additional sources for documents to include in the data base at a future date.

FINANCIAL STATUS:

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CONTRACT FUNDS:

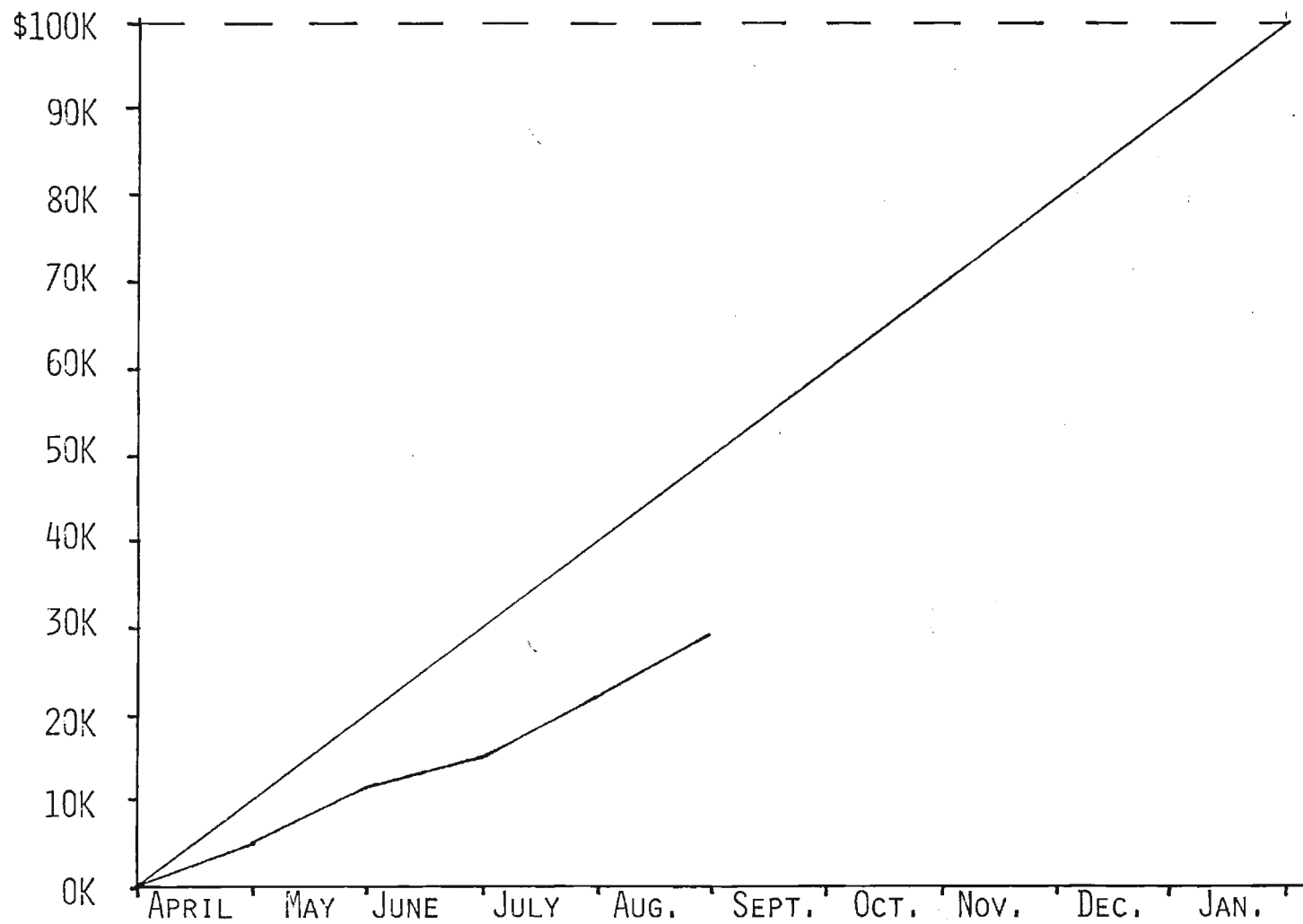
\$95,000.00

EXPENDITURES/ENCUMBRANCES:

	<u>During Reported Period</u>	<u>Accumulated</u>	
Personal Services	\$3822.15	\$15089.97	
Retirement	424.64	1630.73	
Overhead	2790.17	11232.84	
Materials and Supplies	-	8.34	
Travel	5.85	1249.19	
TOTALS:	\$7042.81	\$29211.07	\$29,211.07

BALANCE:

\$65,788.93



CONTRACT #F33657-80-G-0077

TOTAL EXPENDITURES

A-2620



Georgia Institute of Technology

ENGINEERING EXPERIMENT STATION

ATLANTA, GEORGIA 30332

4 November, 1980

Commander
U.S. Army Electronics Research and Development Command
Electronic Warfare Laboratory
Ft. Monmouth, N.J. 07703

Attention: Mr. John Cervini, DELEW-E


Subject: Contract No. F33657-80-G-0077
Delivery Order IY-01
"Unintentional Radiation Exploitation (URE) Techniques"
Deliverable Item A002
Monthly Status Report for the Period 1-30 September, 1980

Gentlemen:

Enclosed are five (5) copies of the subject report, which documents technical activity and expenditures during, and the financial status as of the end of, the reporting period.

Please contact me if there are any questions about either the technical or financial aspects of this report.

Respectfully submitted,


John H. Bordelon,
Research Engineer II
Associate Project Director

Approved:

Larry D. Holland, P.E.
Chief, ESM Division

JHB/jjh
Enclosures

"UNINTENTIONAL RADIATION EXPLOITATION (URE) TECHNIQUES"

Monthly Status Report
for the Period 1-30 September, 1980

Contract No. F33657-80-G-0077
Delivery Order IY-01
Deliverable Item A002

4 November, 1980

Prepared for
U.S. Army Electronics Research and Development Command
ELECTRONIC WARFARE LABORATORY, DELEW-E
Ft. Monmouth, N.J. 07703

Prepared by
GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station
Systems Engineering Laboratory
ESM Division
Atlanta, Georgia 30332

OBJECTIVE:

The purpose of this research program is to identify and assess the feasibility of techniques for exploiting unintentional radiation from systems which emit electromagnetic energy. The objective of the program is to develop effective concepts and specifications for hardware suitable for field test feasibility determination.

ACTIVITIES DURING REPORTING PERIOD:

The document containing threat primary information was reviewed and finalized. A bibliography of RINT reports, prepared by the USAF ESC in San Antonio, was reviewed for reports of interest; the document was not recent.

Upon direction of the EWL technical monitor, further work on RINT applications solely for Quicklook II, and on examination of applications for TEAMPACK, were deemphasized.

PROBLEMS ENCOUNTERED:

No problems were experienced.

PLANS FOR NEXT REPORTING PERIOD:

Contact ESC to find out if an updated version of their bibliography exists.

FINANCIAL STATUS:

The financial status of the contract, as of the end of the reporting period, is given below in tabular form and presented graphically in the attached figure.

CONTRACT FUNDS:

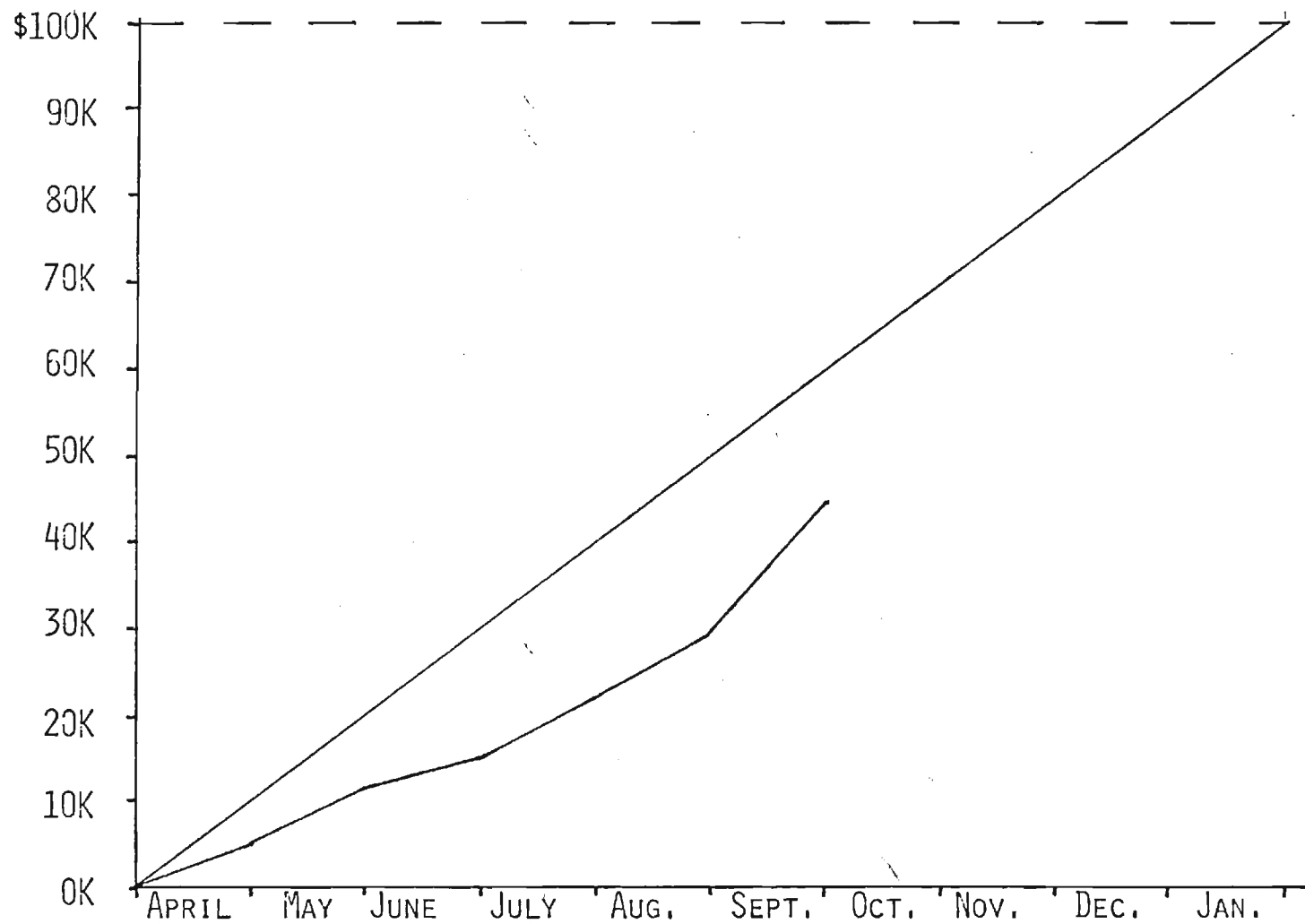
\$95,000.00

EXPENDITURES/ENCUMBRANCES:

	<u>During Reported Period</u>	<u>Accumulated</u>
Personal Services	\$ 8,438.35	\$23,528.32
Retirement	937.50	2,568.23
Overhead	6,160.00	17,392.84
Materials and Supplies	63.42	71.76
Travel	<u>0.00</u>	<u>1,249.19</u>
TOTALS:	\$15,599.27	\$44,810.34

BALANCE:

\$50,189.66



CONTRACT #F33657-80-G-0077

TOTAL EXPENDITURES

H-2626



Georgia Institute of Technology

ENGINEERING EXPERIMENT STATION

ATLANTA, GEORGIA 30332

1 December, 1980

Commander

U.S. Army Electronics Research and Development Command

Electronic Warfare Laboratory

Ft. Monmouth, N.J. 07703

Attention: Mr. John Cervini, DELEW-E

Subject: Contract No. F33657-80-G-0077
Delivery Order IY-01
"Unintentional Radiation Exploitation (URE) Techniques"
Deliverable Item A002
Monthly Status Report for the Period 1-31 October, 1980

Gentlemen:

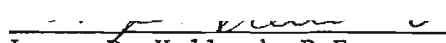
Enclosed are five (5) copies of the subject report, which documents technical activity and expenditures during, and the financial status as of the end of, the reporting period.

Please contact me if there are any questions about either the technical or financial aspects of this report.

Respectfully submitted,

John H. Bordelon,
Research Engineer II
Associate Project Director

Approved:


Larry D. Holland, P.E.
Chief, ESM Division

JHB/jjh
Enclosures

"UNINTENTIONAL RADIATION EXPLOITATION (URE) TECHNIQUES"

Monthly Status Report
for the Period 1-31 October, 1980

Contract No. F33657-80-G-0077
Delivery Order IY-01
Deliverable Item A002

1 December, 1980

Prepared for
U.S. Army Electronics Research and Development Command
ELECTRONIC WARFARE LABORATORY, DELEW-E
Ft. Monmouth, N.J. 07703

Prepared by
GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station
Systems Engineering Laboratory
ESM Division
Atlanta, Georgia 30332

OBJECTIVE:

The purpose of this research program is to identify and assess the feasibility of techniques for exploiting unintentional radiation from systems which emit electromagnetic energy. The objective of the program is to develop effective concepts and specifications for hardware suitable for field test feasibility determination.

ACTIVITIES DURING REPORTING PERIOD:

The USAF ESC in San Antonio was contacted to see if an updated version of their RINT bibliography existed. It does not, so a trip to examine their files has been planned. Analysis of concepts for using URE in the Army mission continued, and a measurement program was conducted to extend the existing URE data base.

PROBLEMS ENCOUNTERED:

No problems were experienced.

PLANS FOR NEXT REPORTING PERIOD:

A visit to the USAF ESC will be made to examine their RINT report file for items of interest.

FINANCIAL STATUS:

The financial status of the contract, as of the end of the reporting period, is given below in tabular form and presented graphically in the attached figure.

CONTRACT FUNDS:

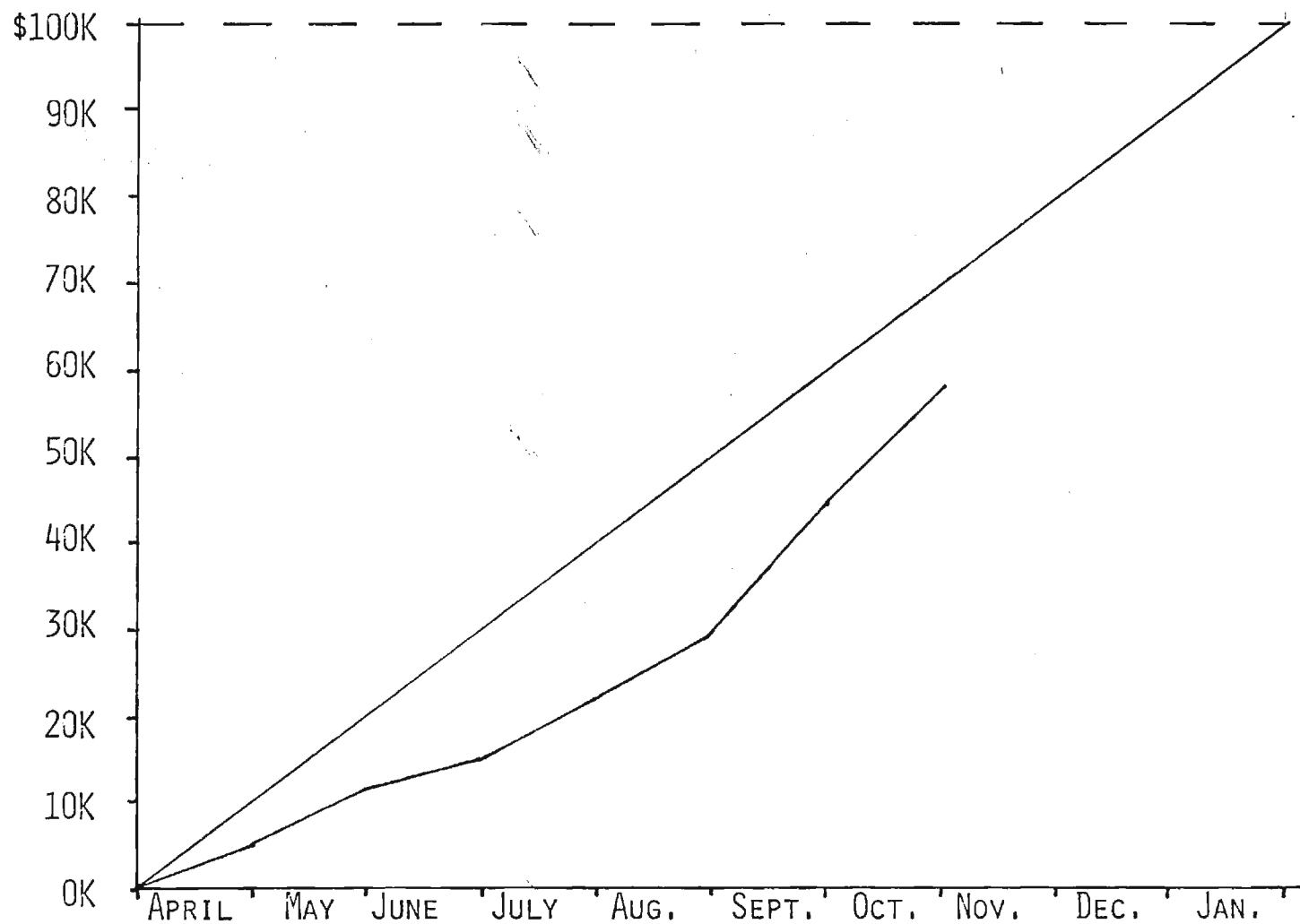
\$95,000.00

EXPENDITURES/ENCUMBRANCES:

	<u>During Reported Period</u>	<u>Accumulated</u>
Personal Services	\$ 7,053.50	\$30,581.82
Retirement	783.63	3,351.86
Overhead	5,149.06	22,541.90
Materials and Supplies	0.00	71.76
Travel	<u>0.00</u>	<u>1,249.19</u>
TOTALS:	\$12,986.19	\$57,796.53

BALANCE:

\$37,203.47



CONTRACT #F33657-80-G-0077

TOTAL EXPENDITURES



Georgia Institute of Technology

ENGINEERING EXPERIMENT STATION

ATLANTA, GEORGIA 30332

5 January, 1981

Commander
U.S. Army Electronics Research and Development Command
Electronic Warfare Laboratory
Ft. Monmouth, N.J. 07703

Attention: Mr. John Cervini, DELEW-E

Subject: Contract No. F33657-80-G-0077
Delivery Order IY-01
"Unintentional Radiation Exploitation (URE) Techniques"
Deliverable Item A002
Monthly Status Report for the Period 1-30 November, 1980

Gentlemen:


Enclosed are five (5) copies of the subject report, which documents technical activity and expenditures during, and the financial status as of the end of, the reporting period.

Please contact me if there are any questions about either the technical or financial aspects of this report.

Respectfully submitted,

John H. Bordelon,
Research Engineer II
Associate Project Director

Approved:


Larry D. Holland, P.E.
Chief, ESM Division

JHB/jjh
Enclosures

"UNINTENTIONAL RADIATION EXPLOITATION (URE) TECHNIQUES"

Monthly Status Report
for the Period 1-30 November, 1980

Contract No. F33657-80-G-0077
Delivery Order IY-01
Deliverable Item A002

5 January, 1981

Prepared for
U.S. Army Electronics Research and Development Command
ELECTRONIC WARFARE LABORATORY, DELEW-E
Ft. Monmouth, N.J. 07703

Prepared by
GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station
Systems Engineering Laboratory
ESM Division
Atlanta, Georgia 30332

OBJECTIVE:

The purpose of this research program is to identify and assess the feasibility of techniques for exploiting unintentional radiation from systems which emit electromagnetic energy. The objective of the program is to develop effective concepts and specifications for hardware suitable for field test feasibility determination.

ACTIVITIES DURING REPORTING PERIOD:

A visit to the USAF ESC in San Antonio was made to examine their RINT data files. Considerable information of interest was identified and necessary arrangements determined for transmitting copies of selected materials to Georgia Tech/EES via the EWL Technical Monitor.

Georgia Tech/EES personnel visited EWL on 24 November for discussions of field measurements, and of several potential applications of RINT/URE to be treated in the final report.

Writing of the final report was begun.

PROBLEMS ENCOUNTERED:

No problems were experienced.

PLANS FOR NEXT REPORTING PERIOD:

The final report will be finished and submitted in draft form.

FINANCIAL STATUS:

The financial status of the contract, as of the end of the reporting period, is given below in tabular form and presented graphically in the attached figure.

CONTRACT FUNDS:

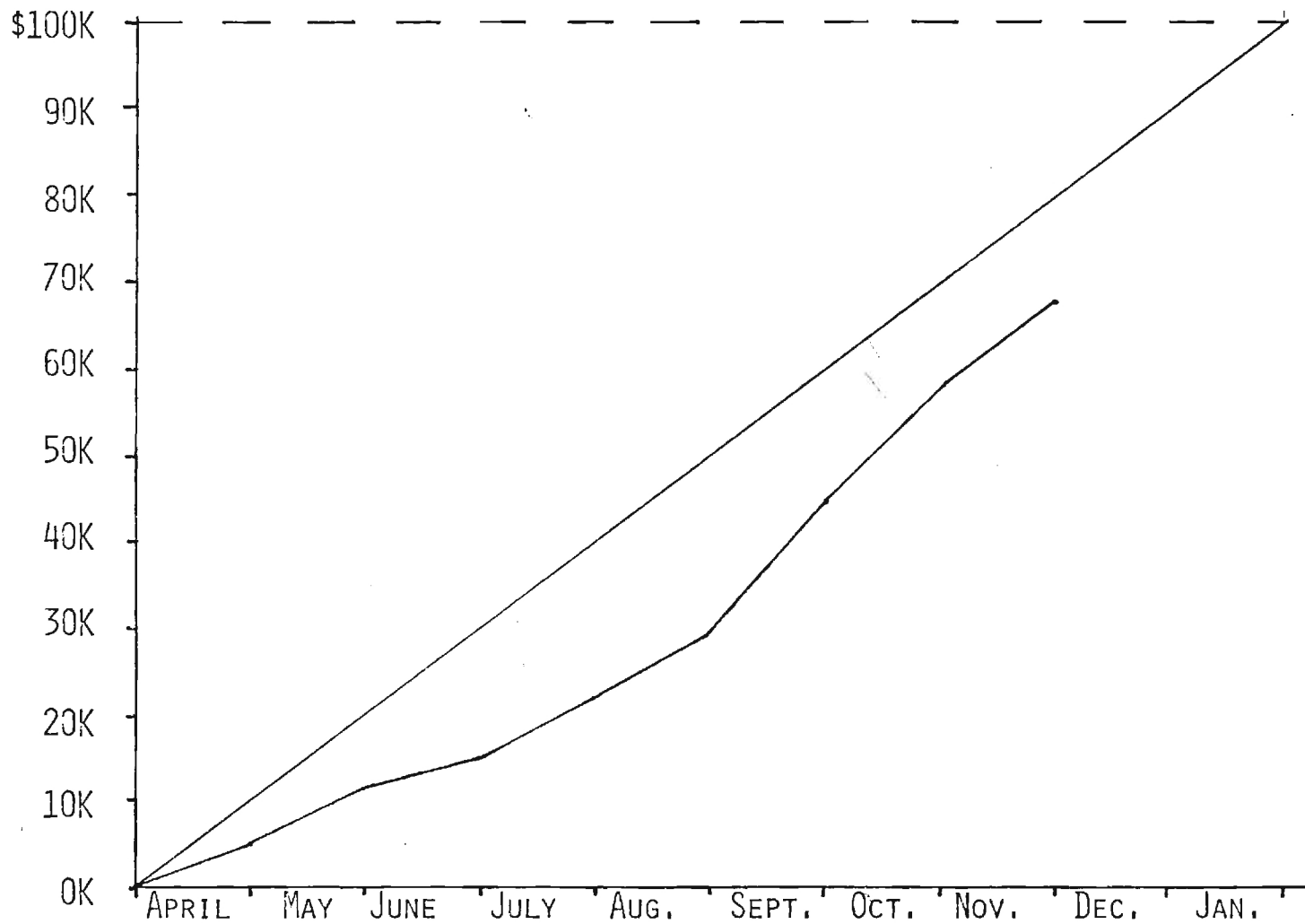
\$95,000.00

EXPENDITURES/ENCUMBRANCES:

	<u>During Reported Period</u>	<u>Accumulated</u>
Personal Services	\$ 5,221.16	\$35,802.98
Retirement	580.08	3,931.94
Overhead	3,811.45	26,353.35
Materials and Supplies	43.60	115.36
Travel	340.00	1,589.19
TOTALS:	\$ 9,996.29	\$67,792.82

BALANCE:

\$27,207.18



CONTRACT #F33657-80-G-0077

TOTAL EXPENDITURES



Georgia Institute of Technology

ENGINEERING EXPERIMENT STATION

ATLANTA, GEORGIA 30332

29 January, 1981

Commander
U.S. Army Electronics Research and Development Command
Electronic Warfare Laboratory
Ft. Monmouth, N.J. 07703

Attention: Mr. John Cervini, DELEW-E

Subject: Contract No. F33657-80-G-0077
Delivery Order IY-01
"Unintentional Radiation Exploitation (URE) Techniques"
Deliverable Item A002
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Gentlemen:

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Respectfully submitted,

John H. Bordelon,
Research Engineer II
Project Director

Approved:

Larry D. Holland, P.E.
Chief, ESM Division

JHB/jjh
Enclosures

"UNINTENTIONAL RADIATION EXPLOITATION (URE) TECHNIQUES"

Monthly Status Report
for the Period 1-31 December, 1980

Contract No. F33657-80-G-0077
Delivery Order IY-01
Deliverable Item A002

29 January, 1981

Prepared for
U.S. Army Electronics Research and Development Command
ELECTRONIC WARFARE LABORATORY, DELEW-E
Ft. Monmouth, N.J. 07703

Prepared by
GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station
Systems Engineering Laboratory
ESM Division
Atlanta, Georgia 30332

OBJECTIVE:

The purpose of this research program is to identify and assess the feasibility of techniques for exploiting unintentional radiation from systems which emit electromagnetic energy. The objective of the program is to develop effective concepts and specifications for hardware suitable for field test feasibility determination.

ACTIVITIES DURING REPORTING PERIOD:

All efforts this month centered around finishing the final report.

PROBLEMS ENCOUNTERED:

The material extracted from ESC documents was not received.

PLANS FOR NEXT REPORTING PERIOD:

The final report will be finished and submitted in draft form.

FINANCIAL STATUS:

The financial status of the contract, as of the end of the reporting period, is given below in tabular form and presented graphically in the attached figure.

CONTRACT FUNDS:

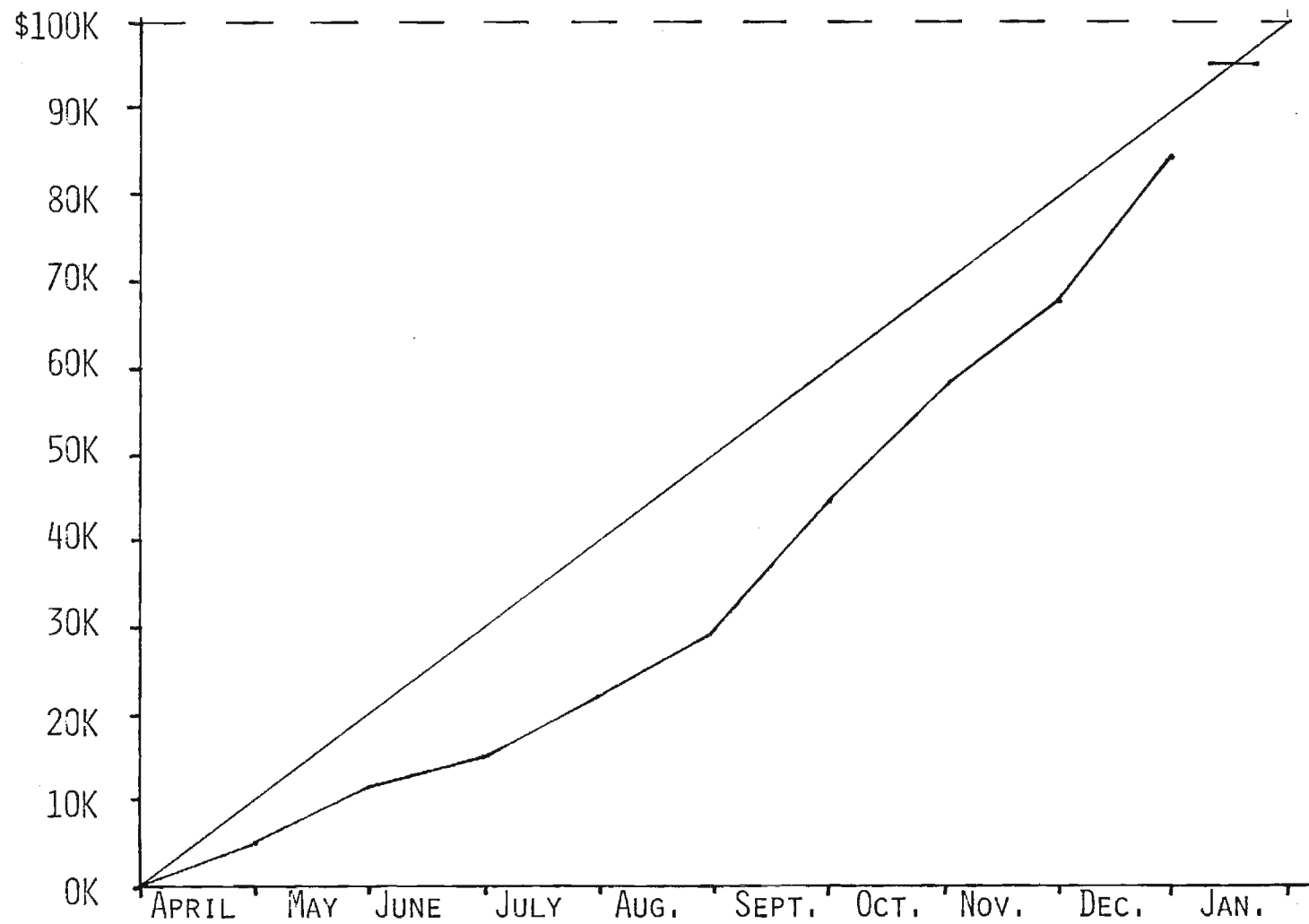
\$95,000.00

EXPENDITURES/ENCUMBRANCES:

	<u>During Reported Period</u>	<u>Accumulated</u>
Personal Services	\$ 8,267.20	\$44,070.18
Retirement	915.91	4,847.85
Overhead	6,035.06	32,388.41
Materials and Supplies	0.00	115.36
Travel	<u>1,549.07</u>	<u>3,138.26</u>
TOTALS:	\$16,767.24	\$84,560.06

BALANCE:

\$10,439.94



CONTRACT #F33657-80-G-0077

TOTAL EXPENDITURES